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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,222	09/03/2003	Jin Li	M4065.0735/P735	2741

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EXAMINER	
NGUYEN, JOSEPH H	

ART UNIT	PAPER NUMBER
2815	

MAIL DATE	DELIVERY MODE
10/15/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/653,222	LI, JIN	
	Examiner	Art Unit	
	JOSEPH NGUYEN	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *52 and 56-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *52 and 56-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/11/2008 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 52 and 56-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (U.S. Publication No. 2004/0080006) in view of Ichikawa et al. (U.S. Patent No. 6,473,144).

Regarding claim 52, Yamamoto discloses an imager device comprising a substrate (301, fig. 3) having a plurality of photosensitive regions (303, fig. 3); and a microlens array (701, fig. 8) formed over the plurality of photosensitive regions, the microlens array comprising a first light conductor (305, fig. 3) having a plurality of

concave recesses (fig. 7 and paragraph [0023]) and a second light conductor (311, fig. 9) within each recess and over substantially planar surfaces formed between the concave recesses of the light conductor, the second light being the top surface of the imager device, and wherein a portion of said second light conductor over said planar surface of said first light conductor has a certain thickness. Yamamoto does not disclose this portion of the second light conductor having a thickness approximately equal to $\lambda/2*N$ as claimed. However, Ichikawa et al. discloses in figure 9 an anti reflection film (26) formed of a high refractive index material, e.g. TiO_2 having a thickness $d1= \lambda/2*n1$ wherein λ is the design wavelength (also wavelength that enters the anti reflection film 26) and n1 is the refractive index of the film 26. See column 12, lines 55-61. Further, Ichikawa et al. teaches this anti reflection film is used to prevent crosstalk between pixels and thereby improve the light utilization efficiency (column 12, lines 19-20). It is noted that this anti reflection film 26 is formed of TiO_2, which is light conducting material. As such, this anti reflection film 26 is also a light conductor. In view of such teaching, it would have been obvious at the time of the present invention to modify Yamamoto by including the portion of the second conductor having a thickness approximately equal $\lambda/2*N$ so as to prevent crosstalk between pixels and thereby improve the light utilization efficiency. It is noted that the phrase the "planar surface capable of reducing crosstalk between adjacent photosensitive regions by spectral reflectance" is merely functional language. The modified imager device by Yamamoto and Ichikawa et al. with a similar structure and material as claimed would comprise the

planar surface capable of reducing crosstalk between adjacent photosensitive regions by spectral reflectance herein.

Regarding claim 56, Yamamoto discloses the first light conductor (305) has a first index of refraction (paragraph [0016]) and the second light conductor (311) has a second index of refraction (paragraph [0025]) that is different from the first index of refraction.

Regarding claim 57, Yamamoto discloses the first index of refraction is less than the second index of refraction (paragraph [0025]).

Regarding claim 58, Yamamoto discloses the second light conductor is formed of a polymer (paragraph [0025], lines 8-9).

Regarding claim 59, Yamamoto discloses in paragraph [0014], lines 1-3 a color filter (207, fig. 2) is placed between the microlens (205) and the light sensitive element (photosensitive element). Since the microlens comprises the first light conductor, this color filter is placed below the first light conductor.

4. Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto and Ichikawa et al. and further in view of Hook et al. (U.S. Patent No. 5,898,196).

Regarding claim 60, Yamamoto discloses in figure 3 the photosensitive regions (303). Yamamoto nevertheless does not disclose the photosensitive region having a p+ type region formed over an n-type region. However, Hook et al. discloses in figure 2a

the photosensitive (p+/n- regions on the left hand side of the device) having a p+ type region formed over an n- type region. In view of such teaching, it would have been obvious at the time of the present invention to further modify Yamamoto and Ichikawa et al. by including the photosensitive region having a p+ region formed over an n- region so as to form a photosensitive (photosensor) in an imager device.

5. Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto and Ichikawa et al. and further in view of Kochi et al. (U.S. Patent No. 6,188,094).

Regarding claim 61, Yamamoto and Ichikawa et al. disclose substantially all the structures set forth in claim 61 except for a shielding layer formed below the first light conductor. However, Sochi et al. discloses in figure 1 an imager device comprising a shielding layer (105) below the first light conductor (108). In view of such teaching, it would have been obvious at the time of the present invention to further modify Yamamoto and Ichikawa et al. by including a shielding layer formed below the first light conductor so as to strictly focus lights into the photosensitive regions in a desired manner.

6. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto and Ichikawa et al. and further in view of Lee et al. (U.S. Publication No. 2002/0162943).

Regarding claim 62, Yamamoto and Ichikawa et al. disclose substantially all the structures set forth in claim 62 except for at least one microlens in the array having a focal point being off center in relation to an underlying respective photosensitive region. However, Lee et al. discloses in figure 4 an imager device comprising at least one microlens (410) in the array (410, 412, 414, 416) having a focal point being off center in relation an underlying respective photosensitive region (420) so as to focus radiation to the selected photosensitive region (detector). See paragraph [0034]. In view of such teaching, it would have been obvious at the time of the present invention to further modify Yamamoto and Ichikawa et al. by including at least one microlens in the array having a focal point being off center in relation to an underlying respective photosensitive region so as to focus radiation to the selected photosensitive region.

Response to Arguments

7. Applicant's arguments with respect to claims 52 and 56-62 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (571) 272-1734. The examiner can normally be reached on Monday-Friday, 8:30 am- 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on (571) 272-2298. The fax phone number for

the organization where this application or proceeding is assigned is (571) 273-8300 for regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Joseph Nguyen/
Examiner, Art Unit 2815
/Kenneth A Parker/

Supervisory Patent Examiner, Art Unit 2815